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Group of Experts on Multimodal Transport

THE EFFECTS OF EDP AND EDI ON TRANSPORT ORGANIZATIONS AND USERS

Note by the UNCTAD secretariat

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Abbreviations

ECE	Economic Commission for Europe
EDI	electronic data interchange
EDIFACT	electronic data interchange for administration commerce and transport
EDP	electronic data processing
ESCAP	Economic and Social Commission for Asia and the Pacific
FALPRO	UNCTAD Special Programme for Trade Facilitation
IATA	International Air Transport Association
IDEA	International Data Exchange Association
LAN	local area network
PC	personal computer
UNSM	United Nations standard message

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INTRODUCTION

(i) In its resolution 67 (XIV), paragraph 1, the Committee on Shipping requested the Secretary-General of UNCTAD to convene a group of experts to discuss developments in multimodal transport and containerization wherever there is a sea link, to take stock of the principal problems that are experienced by users and providers of multimodal and/or container transport operations and to suggest elements of a future programme of work for the Committee in the field of multimodal transport and containerization.

(ii) In order to facilitate the work of the group of experts, the Committee requested the secretariat to make available a series of studies on different aspects of multimodal transport, *inter alia* "a study on the effects of EDI and EDP on transport organizers and shippers, consignees, terminal operators and customs authorities of developing countries and obstacles they are facing with the introduction of EDI and EDP in co-operation with relevant organizations..."[1]

(iii) The present report has been prepared in response to this request. It draws on a number of recent papers dealing with the subject, including one by the Transport and Communications Division of ESCAP, entitled "Electronic data interchange (EDI) systems for transport related and trade facilitation activities", and summarizes its main findings. The ESCAP report is made available in English as a supplement to the present report.[2] Also taken into consideration is work done within the Economic Commission for Europe's Trade Division's working party on facilitation of international trade procedures (WP4) which deals *inter alia* with electronic data interchange (EDI).

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1 Report of the Committee on Shipping on its fourteenth session, (TD/B/C.4/336), resolution 67 (XIV), paragraph 3 (c).

2 ESCAP's documents are only available in English.

SUMMARY AND CONCLUSIONS

1. Computerization or, as it is also known, electronic data processing (EDP) is now widely used within the transport industry. Even a small freight forwarder is likely to have a word processor and a simple accounting programme package for the printing of invoices or the preparation of bills of lading. This is quite different from the era before the personal computer (PC) became everyman's tool. In those days the mainframe or mini computers required were so expensive that only large companies could afford them. Having invested in expensive hardware, transport companies discovered a need for special software programmes to be written for their particular use. This process was often long, expensive and fraught with risks.[3] Smaller transport companies did not have the financial capability - or perhaps the need - to invest in such "fancy" equipment. So, while the larger companies sweated and persevered with the development of EDP, the smaller ones continued to operate, quite successfully, with manual systems.

2. During this process, however, the larger companies learnt useful lessons, and when the microcomputer revolution took off, they were well placed to take full advantage of the possibilities of electronic communications with their trading partners which the new equipment offered. They were, in other words, a way ahead of their competitors, namely, the small transport providers.

3. The larger transport companies thus began investigating the potential of electronic data interchange (EDI).[4] It allowed them to communicate electronically with their clients, their branch offices and agents. They were consequently able to offer a new - and higher - degree of services to their clients, just as the small transport providers were congratulating themselves with having "caught up" with the big ones through the installation of new PC's.

4. Competition between transport providers is today thus not so much between those from developed countries *versus* those from developing countries, but rather between those who offer full EDI services *versus* those who do not. In other words, it is the big *versus* the small. This problem is discussed in another UNCTAD paper which *inter alia* touches on the possible effect of the emergence of the so-called "mega carriers" and which is also made available to the Experts.[5] The possibilities created by EDP were highlighted almost four years ago in an article on the European freight forwarding and transport industry which stressed the necessity of investing in data processing equipment as "the only way freight forwarders can perceive of improving their profitability".[6] It would seem that this stage has now been surpassed by a need to invest in EDI equipment if companies are to stay in business.

5. From this situation some conclusions may be drawn:

   (a) If developing countries' transport providers are to thrive, they must take full advantage of both EDP and EDI, which means investigating in the appropriate amount of equipment. Indications are that the screen/person ratio should be at least 1:3, with the long-term goal of 1:1;

   (b) Developing countries' transport companies must provide adequate EDP training to all staff using EDP equipment;

   (c) Local training institutions should provide EDP courses particularly geared towards the transport industry through part-time or evening classes; and

   (d) A large number of "off-the-shelf" software packages for the transport industry exists. However, selection of the "right" software for transport providers and users must receive careful attention since the choice of inappropriate software may have serious economic consequences;

6. The ESCAP report referred to in the introduction states that: "the full benefits of EDI are only

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3 M. John, and D. Wright, "Impact of information technology on the methods and working systems of the freight forwarding industry", London/Washington D.C., *Maritime Policy & Management*, Volume 18, No. 2, April-June 1991, pp. 116-119.

4 EDI has been defined as "the computer-to-computer transfer of commercial and administrative transactions using an agreed standard to structure the data pertaining to that transaction".

5 *Practical problems faced by governments and commercial parties involved in multimodal transport operations to and from developing countries* (TD/B/C.4/AC.11/4).

6 "The central role of information technology in transport strategy", *Lloyd's List*, London, 9 October 1990, p. 8.

maximized when most or all of the active parties are linked into the system. With the adoption of EDIFACT[7] standards and the effort to optimize EDI systems, it would appear that in the long term, a global EDI system will be available. It is therefore essential that any initiative taken at this time will have the capacity for future connection to the global network. This dictates the use of international EDI message standards. Hence, the developers of EDI systems must consider strategic planning for electronic trading before embarking on detailed national or industry-based developments."[8]

7. The report continues:

"...the question of whether the introduction of EDI should begin with only one, some or all of the transport and trade facilitation activities depends largely on:

(i) The business and trading needs for EDI;
(ii) The availability of resources in terms of:

- Funding capacity;
- Telecommunications infrastructure;
- Computer hardware and software; and
- Technical expertise.

(iii) The cost and benefits to users."[9]

8. The conclusions end with the observation:

"...there is no single EDI system that could provide a role model which will be suitable for all countries...; each country has different trading needs, practices and economic conditions. However, those countries planning for EDI are in the enviable position of being able to learn from the pioneers and choose the best features of existing systems to arrive at a solution appropriate to the business needs and priorities of each country.

For the future, there will remain a global need for information on EDI developments so that countries embarking on EDI will be able to exploit the experiences of others in streamlining their own EDI development process."[10]

9. Decisions regarding the use of one type of EDI messages over another, particularly as they concern local (non-international) messages must be taken with careful regard to transmission costs and following careful determination of which data elements really need to be transmitted.

10. On the question of the relevance of EDI to the promotion of multimodal transport, the International Air Transport Association (IATA) has said that it supports proposals for inter-airline EDP exchanges because it has been demonstrated that "the key obstacle to effective use of air speed in origin-destination transport was a set of interlocking inefficiencies in the controlling of the information flow." "Origin-destination transport" is what multimodal transport is all about.

11. The Group of Experts may wish to take note of the present report and consider including in its proposals for the future programme of work of the Committee on Shipping, in the field of multimodal transport and containerization, an item on the development of EDP/EDI and its influence on developing countries.

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7 EDIFACT stands for Electronic Data Interchange For Administration, Commerce and Transport.

8 *Electronic data interchange (EDI) systems for transport related and trade facilitation activities*, New York, 1991, Report by the ESCAP secretariat (no document number), chapter 8, p. 57.

9 *Idem.*

10 *Ibid.*, p. 59.

Chapter I

ELECTRONIC DATA PROCESSING

12. The proliferation of EDP is no longer confined to developed countries. Its extension to developing countries may be less rapid, but it has nevertheless been considerable, although its influence is difficult to estimate. Before the introduction of PC's, EDP meant mainframe computers or mini computers. These were expensive tools which, compared with today, had only limited computing power. They were thus utilized mainly for a small range of tasks. Japanese shipping companies at the beginning of the 1980s, for example, used their computers to generate the following types of data:

(a) Business statistics;
(b) Cost analysis;
(c) Statistics on staff;
(d) Summaries of voyage revenues and expenses; and
(e) Budgetary data.[11]

The situation was similar in other countries. In other words, computers were operated primarily by and for the accounting department.

13. The last decade, however, witnessed a veritable explosion of computers in developed countries where their massive numbers have resulted in more and more tasks being "computerized". This explosion is now spilling over into developing countries where PC's are also becoming common, if not to the degree achieved in developed countries in which the screen/person ratio is moving towards 1:1. The lowliest scretary and the chief operating officer will each have their own screen and keyboard (but not necessarily their own computer).[12]

14. Initially, the introduction of EDP carried with it the fear that massive redundancies would result, and it was consequently resisted in many places. It is undeniable that certain jobs will be lost through the introduction of almost any new technology, but new technology also entrains new skills and higher-paying jobs. It was pointed out in an earlier UNCTAD report[13] that failure to adapt to a change in technology may have far worse impacts on the national economy than that caused by the addition to the pool of the unemployed of a relatively small number of persons made redundant by the new technology. Today this is certainly the case. Unless the many participants in trade and transport have the tools required for the conduct of day-to-day business, their trading partners will not deal with them. EDP should no longer be considered an enemy, but a saviour. However, it must be introduced and implemented wisely !

15. It would seem superflouous to detail the transformations wrought by the introduction, on a massive scale, of EDP; however, it may be useful to recall the main classes of costs of its introduction:

(a) Hardware (basically the cost of acquisition of terminals);
(b) Software (either off-the-shelf or commissioned by the user);
(c) Possible changes to offices, buildings, wiring because of the introduction of EDP;
(d) Possible rental of additional space (unlikely for PC's);
(e) Staff training and familiarization expenses;
(f) Communications costs (installation/rental of leased lines, etc.);
(g) Cost of disruption to staff, offices and clients during the installation of the new equipment **and during the running in of the new system/technology**.[14]

16. Software is often a major problem. While software houses are becoming better and better at writing appropriate software, the intricacies of tailoring a (possibly "off-the-shelf") programme to a

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11 Hideo Suzuki, "Physical Distribution Industries and Information System Revolution", *Shipping and Trade News*, Tokyo, 19 November 1982, p. 2.

12 Zim Israel Navigation Co., for example, has reached a ratio of 1:1.667 according to "Zim's life-blood flows through electronic veins", *Containerisation International*, London, May 1991, p. 78.

13 *International multimodal transport in developing countries. Issues and References* (UNCTAD/SHIP/156), paras 8-9.

14 Adapted from John and Wright, *op. cit.*, emphasis added.

specific user's requirements are often under-estimated. The same is normally the case for item (g) above. In some tropical climates, computers must be located in a cool, dry environment, possibly necessitating the installation of airconditioning equipment and perhaps making special efforts to reduce the amount of dust in the air. Likewise, voltage equalizers and battery packs may be required to protect data. These are, however, trivial problems that can be solved with relative ease.

17. The introduction of EDP in developing countries is thus somewhat more difficult than in most temperate developed countries, yet, as will be shown in chapter II below, without computers there will be a dramatic reduction in business opportunities. A remaining problem is the proper distribution of computers. They should not be locked up in the managers' offices; neither should the boss of the company feel that there is no need for him to become "computer literate".[15]

18. Implementation of EDP requires qualified staff and the necessary computer literacy must be obtained through appropriate training. Mastery of EDP is not something which can be accomplished during a couple of hours of instructions at even the best training institution. Proficiency is achieved only by long practice and sometimes "bitter experience" in front of a screen. The emphasis here is of course on "long" rather than "bitter". The time element and access implies that a company with only one PC at its disposal cannot have more than one or two individuals become sufficiently familiar with EDP to allow the company to benefit from the investment.

19. A few conclusions may be drawn from this. The first is that a single PC may be insufficient for a company which employs more than four or five persons. The second conclusion is that EDP training is of paramount importance. Even though the cost of EDP equipment has been shrinking, no organization can afford to leave its equipment under-utilized. It is consequently suggested that transport companies pay close attention to the EDP training aspects, and that national or local training institutions consider offering EDP training courses of increasing complexity. Fortunately, such training lends itself very well to part-time or evening study, and it should thus not be very difficult for employees of transport companies to attend EDP classes.

20. As regards the question of which areas of the company's activities would benefit from the introduction of EDP, the answer today must be "practically all". However, each area may require its own sofware packages. The accounting department will not use the package intended for container control, yet both the accounting and the container-control departments will need a common word processing package. The communications packages, whether for internal local-area-network (LAN) use or for EDI purposes, will also be common.

21. Appropriate software packages, correctly utilized, can have a very considerable impact on the economies of developing countries. An example would be the **Advance Cargo Information System** (ACIS), developed by the UNCTAD secretariat, under a technical assistance project for Africa. The main goal of ACIS is to provide information necessary to identify and examine problems caused by the poor management of transport chain logistics. ACIS is a software package which provides relevant advance, spot and statistical information on movements of cargo from port of loading to final inland destination, and of movement of associated transport equipment.

22. A subset of ACIS is its "Railtracker" module which enables national railways to track their wagons. If foreign wagons remain in another country, they are normally liable for a detention charge calculated for each day the wagon remains outside its country of origin. In Malawi, for example, through the use of Railtracker, wagon detention time has been reduced from five to three days and wagon turn-around time has been reduced from six to four days representing an improvement in wagon utilization of 50 per cent.[16] A similar reduction of detention time was observed by the Tanzania-Zambia Railway Authority (TAZARA) after the installation of Railtracker on that railway. Initial wagon turn-around time was reduced from 25 to 20 days.[17]

23. As for staff implications, the introduction of appropriate software will change the daily routines. In the pre-EDP days, railways often spent excessive time, for example, in transmitting data regarding wagon disposition. With a new computerized, linked system, this operation is reduced to a minimum

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15 It is assumed that companies that are large enough to require mini or mainframe computers have achieved a level of "EDP competence" that makes the suggestions in this chapter less relevant for them.

16 Letter dated 4 April 1991 from the Malawi Railways to the UNDP/UNCTAD Chief Technical Advisor in Blantyre reporting on the effects of the introduction of Railtracker in Malawi.

17 Letter dated 27 March 1991, from the Tanzania-Zambia Railway Authority to the UNDP/UNCTAD Chief Technical Advisor in Blantyre reporting on the effects of the introduction of Railtracker on TAZARA.

because data from individual stations can now be made immediately available at the central station. Instead of spending its time on menial tasks, the railway staff can to concentrate on more productive work, thus improving the efficiency of the company. The railways have reported that their image had greatly improved after the introduction of Railtracker.

24. Within ACIS a so-called "Harbour Master System" has been also developed. The Harbour Master System contains four sub-systems, a "Berth Planning Sub-module", a "Manifest Sub-module", a "Gate Pass Sub-module", and a "Port Statistics Sub-module" the use of which will improve the efficiency of any port which is not already using EDP as a means of improved management.

25. Another UNCTAD-developed software package is MULTISHIP, a software programme which assists liner shipping companies with the planning of new services or improvements to existing liner services. MULTISHIP facilitates the selection of liner shipping routes on the basis of commodities, trade requirements, port facilitiies, vessel types, cargo-handling techniques and other factors. Simulated routing systems like these are used by large liner companies, giving them a strong competitive advantage.[18] MULTISHIP allows smaller shipping companies to perform the same type of route analysis without having to develop an expensive proprietary computer programme.

26. Many other software packages exist for the transport industry. Within the shipping sector alone, the **Fairplay Marine Computing Guide 1990** contains more than 350 individual "off-the-shelf" software packages.[19] Many of these can be used without modifications by the purchaser. Transport organizations in developing countries might benefit from scrutinizing such lists for useful packages.

27. The development of EDP has made it possible to communicate electronically with clients. This has encouraged a closer carrier/customer relationship. This was discussed briefly in *Inventory of existing mandates and new draft programme of work in the fields of multimodal transport and technological development* (TD/B/C.4/323),[20] which will be before to the Experts.

28. In more and more countries EDP is becoming a necessity for companies having to deal with, for example, Customs authorities. The question of electronic filing with Customs is considered in chapter II. Here it will suffice to highlight the increasing number of countries which have or are in the process of acquiring yet another UNCTAD-developed software programme, *viz.*, the Automated System for Customs Data and Management (ASYCUDA). As of the autumn of 1991, some 40 countries or territories[21] had already installed or were in the process of implementing the system. Sixteen countries were negotiating projects installations while a further 37 countries had shown an interest in the system. If this interest is converted into implementation, Customs authorities in almost 100 developing countries will have embraced EDP. To take advantage of this new development, their "clients" must do likewise.

29. Some years ago it was stated that "without the aid of data processing equipment, shipping companies (no matter where they might be), will slowly but surely be forced out of the trades by their better-equipped competitors. No amount of cargo sharing will save the inefficient company where expenses continue to exceed income."[22] The same can be said for other transport providers, not to mention their clients: shippers and consignees.

30. At this point a word of caution may be appropriate. Cost savings derived from EDP are often over-estimated. As those familiar with EDP can attest, its introduction has not resulted in a reduction in the use of paper. On the contrary, paper usage has often shown a sharp increase. The expected staff reductions have often likewise proven illusory, however, the ease of correction of data-entry errors and

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18 See for example "Zim's life-blood flows through electronic veins", *op. cit.*, where it was said that "dozens of simulations were run by the planning experts to identify the optimum fleet schedule and marketing scenario," and where Zim was quoted, predictably, to have "declined to disclose details of its long-range planning and marketing positioning application," although the line "highlighted that computer-based real-time information enabled the company to attain optimal fleet deployment, enhanced flexibility, and quick response to changing market conditions", p. 79.

19 Fairplay Marine Computing Guide 1990, 20 Ullswater Crecent, Coulsdon, Surrey CR3 2HR, United Kingdom, Fairplay Publications, 1990.

20 Paragraphs 88-93.

21 Anguilla, Antigua and Barbuda; Bangladesh, Barbados, Benin, British Virgin Islands, Burkina Faso, Burundi, Cape Verde, Central African Republic, Colombia, Comoros, Dominica, El Salvador, Ghana, Gibralta, Grenada, Guatemala, Guinea, Haiti, Honduras, Madagascar, Mali, Mauritania, Mauritius, Montserrat, Netherlands Antilles, Nicaragua, Niger, Panama, Romania, Rwanda, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sudan, Togo, Turks and Caicos, Zaire, and Zimbabwe.

22 Hans Carl, "Data Processing: the Ultimate Tool", *Containerisation International*, London, December 1982, pp. 78-81.

the elimination of multiple re-keying of the same data have created considerable savings and benefits. Efficiency in this area has freed staff to undertake new or formerly neglected tasks, thereby providing clients with an enhanced level of service.

31. Thus it is not so much through the introduction of EDP as through the introduction of EDI that a company may save money. EDI may also - finally - lead to a reduction in the amount of paper required in today's international trading and transport. Indeed, EDI is being heralded as the technology of the paperless society. This has yet to be proved.

Chapter II

ELECTRONIC DATA INTERCHANGE

32. In the course of an international trade transaction, many parties have to produce, check, transfer, receive, process and file hundreds of information elements relating to the goods, their transport and their payment. Such information transfer, traditionally carried out through filling in and transmitting paper documents, is slow, error-prone and costly. With the proliferation of computers and the use of tele-transmission techniques, it has become possible to rationalize the processing and transmission of information. This is normally called "electronic data interchange" or simply EDI. EDI is generally defined as: ***"the computer-to-computer transfer of commercial and administrative transactions using an agreed standard to structure the data pertaining to that transaction"***.

33. The concepts of EDI are now being introduced in all developed countries where a number of systems have been created, linking branches of the same company, counterparts in the same industry (for example, banks, airlines) or small groups of operational partners (for example, Customs and freight forwarders, Customs and airlines, container operators and sea carriers, etc.).

34. Under the auspices of the Economic Commission for Europe (ECE) a global system was eventually created through its Working Party No. 4 on trade facilitation. This Working Party has been instrumental in the development of a set of rules for electronic data interchange for administration, commerce and transport, which has become known under the acronym EDIFACT.

A. Implications for developing countries

35. It has been said that "politicians...cannot afford to...widen the gap between developed and developing economies. You cannot throw advanced EDI bridges over that gap, without first setting up a supporting infrastructure of sound, simple procedures and documentation."[23] This was precisely the reason why the Committee on Shipping recognized "the need to avoid widening the gap between the developed and developing countries with regard to the implementation of multimodal transport and electronic data interchange."[24]

36. A few years ago the International Data Exchange Association (IDEA) published a discussion paper entitled "Electronic Data Interchange and Developing Countries".[25] This paper began,

> "Electronic data interchange (EDI), direct transmission of information between separate data-processing systems, by agreed standard messages, may seem an innocuous and somewhat technical activity. In practical fact, it is already revolutionising the movement of goods and money, in national and international trading, and will have much wider, deeper effects on commercial practices and government administration.
>
> In developed economies, including especially west European, American and Japanese markets, the ability to link individual computer systems for real-time information exchanges has reinforced the competitive advantages of multi-national business enterprises, underpinned "just-in-time" supply/distribution techniques, slashed inventory costs, multiplied transport options and greatly accelerated essential cash-flows..."[26]

37. An example of the consequences of a fully automated EDI environment - where trading partners have developed application software programmes which eliminate human decision-making with respect

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23 John Raven, "Electronic data interchange - an institutional crossroads", IDEA Discussion paper No. 3, Brussels, International Data Exchange Association, September 1988, p. 9.

24 Report of the Committee on Shipping on its fourteenth session (TD/B/C.4/336), resolution 67 (XIV), seventh introductory paragraph.

25 John Raven, "Electronic Data Interchange and Developing Countries", IDEA Discussion Paper No. 2, Brussels, International Data Exchange Association, 1988.

26 *Ibid.*, p. 1.

to particular transactions - can be found in a recent report published by the American Bar Association.[27] This report, which contains a model electronic data interchange trading partner agreement and a commentary on this agreement, gives as an example a situation where in company ABC, when inventory of a certain consumable item reaches a certain predetermined level, ABC's computer might automatically generate an appropriate purchase order, "including terms as to price, quantity and similar items pre-defined to be within the parameters of the business relationship" which the company has with company XYZ.[28] Similarly, XYZ's computer may be programmed automatically to accept any purchase order whose terms fall within predefined parameters. The report finds that "this process may be sufficient, if fully established, to permit ordering, shipping, invoicing and payment to occur electronically with human review and intervention, if it occurs at all, limited to supervisory summaries of daily activities."[29] The significance of this development is not difficult to grasp.

38. The implications for developing countries of the rapid development of EDI are extremely important, yet poorly understood. In spite of what has been said above (paragraph 35), competition is leading towards the imposition, by developed economies on developing ones, of a technology for which the majority of developing countries is ill-prepared.

39. The IDEA discussion paper cited above goes on to say:

> "Main third world requirements, at the present stage of EDI development are extremely modest in comparison with the benefits that both North and South can expect from timely, appropriate response. The urgent need is for information, contacts, expertise and encouragement.
>
> Unfortunately EDI enthusiasts - including the EEC Commision - seem to be hypnotised by the speed and scope of events in Europe, the US and Japan. None of the innumerable general and specialised EDI seminars which have proliferated in the last two or three years have mounted any worth-while examination of implications for the rest of the world.
>
> Lending and funding agencies have scarcely accustomed themselves to the recent switch of basic aid strategies from projects to programmes, and still tend to operate - and think - in terms of separate country, sectoral, or, at best, regional compartments...
>
> EDI is too recent a development to have reached the business schools, let alone the relatively few institutions which specialise in the transfer of knowledge and know-how from developed to developing countries. The result of all these factors is that the sort of information and contact flow which is needed cannot use the normal main channels of communication, influence and encouragement.
>
> There can be no doubt of the total balance of advantage for any developing economy. Resources are so scarce and international competition so demanding, that it would be simple folly to throw away any opportunity of optimising the use of computer systems in international trade, and, at the same time, improving internal business efficiency and administrative cohesion.
>
> For the world at large, it is now a truism that prosperity is indivisible. The cost gap between developed and developing countries, in terms of international trade procedures and documentation, is already wide enough. The latest EEC figures show that traditionally accepted on-costs represented by these requirements, of about 10 per cent of the average value of general cargo consignments, is now down, in intra-Community trade, to about 1.8 per cent...
>
> It is in no-one's interest that EDI should force developing countries even further down the ladder of competitive competence. Nor should the Community be the only focus of anxiety. Every lending and funding agency will find, on examining its current assistance programmes, that substantial and growing amounts in almost every economic sector, are being applied, quite rightly, to communications and computer projects. Insofar as these are being supplied and applied in isolation from understanding of EDI perspectives and principles, they could well turn out to be investments in incompatibility..."[30]

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27 *The commercial use of electronic data interchange - a report*, American Bar Association, n.p., 1990, (to be published in "44 BUS. Law.___").

28 *Ibid.*, p. 15.

29 *Idem.*

30 Raven, *op. cit.*, p. 7.

B. EDIFACT

40. The UNCTAD report "Developments in multimodal transport" (TD/B/C.4/328), which is also before the Experts, contained a section on the developments of EDI.[31] The report highlights the development of EDIFACT and the increase in the number of EDIFACT Rapporteur Groups. It mentioned the possibility of a fifth EDIFACT Rapporteur Group being created in Asia. This happened with the appointment of a Japan/Singapore EDIFACT Board in 1990. At the September 1991 meeting of the Working Party of the Economic Commission for Europe's Committee on the Development of Trade on Facilitation of International Trade Procedures (WP4), this EDIFACT Board changed its name to the Asian EDIFACT Board, since China and the Republic of Korea had recently joined Japan and Singapore.[32] Taiwan, Province of China[33] participates in the Board's work as an observer.

41. Before the thirty-fourth session, in September 1991, of WP4, the development of United Nations Standard Messages (UNSMs), which are based on EDIFACT, had not been nearly as speedy as the industry had hoped. At the same time, there was in some quarters considerable scepticism as to the economy of converting current EDI standard messages to the EDIFACT format, owing to the possible increase in transmission costs thereof. This concern has been dealt with at some length in the ESCAP report which is being made available to the Experts with the present paper.

42. Fortunately, the thirty-fourth session of WP4 resulted in an appreciable speed-up of the process of message development, in that a total of 16 UNSMs receiving "Status 2" (messages released for practical use), 15 UNSMs received "Status 1" (messages released for trial) and 22 UNSMs received "Status 0" (messages under development). Over 40 additional messages are being prepared for UNSM Status 0. This will undoubtedly revive confidence in the EDIFACT process, although it still has some way to go before convincing the business community at large of the merits of EDIFACT in the standardization of EDI messages. In this connection it may be worth noting that a leading shipowner's representative recently observed that "a little more common sense is undoubtedly needed...everyone praises his own electronic data system as the most sophisticated and the most precise. Shippers...are now confronted with ten different EDI systems."[34]

43. In a recent commentary by the Hong Kong Trade Facilitation Council the implications of the development of EDIFACT for developing countries were described as disturbing, since, "there seems a chance that UN/EDIFACT could, without anyone's wishing it to do so, become the restricted preserve of the richer nations, with all this implies in the way of non-tariff barriers to trade."[35] The commentary continued:

> "...there seems a risk that in time the appointment of Rapporteurs could inadvertently take on a political tinge. Very obviously, the outstanding considerations in the appointment of a Rapporteur must be the competence of the candidate to fulfil his role, **and his access to extensive and at times costly support facilities.** This of itself restricts drastically the number of candidates that the Asia/Pacific can field. It would manifestly be unwelcome and unweildy for individual nations, or block of nations, to press their claims to Rapporteurship simply as a matter of either national prestige or economic aggression."[36]

44. This having been said, it may be useful to return to the the IDEA paper which ended:

> "The promotion of knowledge and use of EDI techniques and standards...in developed and developing countries, will...depend very largely on the judicious deployment of the relatively few Customs officers who have practical experience of the design and commissioning of computer systems.
>
> Customs attitudes have already had a profound influence on facilitation. Past experience shows that once Customs adapt their declaration forms to the UN lay-out key, the whole trading sector tends to move rapidly to adopt the entire aligned documentary system. Customs use of international EDI standards could exercise the same benevolent data dictatorship over commercial computerisation policies.

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31 *Developments in multimodal transport* (TD/B/C.4/328), paras. 10-39.

32 ECE WP4 GE.1, draft report of the forty-fourth session, para. 14.

33 In the Asian EDIFACT Board known as "China, Taiwan".

34 Andrew J. Abbott, Executive Vice President of Atlantic Container Line, as quoted in "Shipping must get back to essentials", *International Transport Journal, Overseas Digest*, Basel, No. 23, 7 June 1991, p. 2031.

35 "TFC NEWS", Hong Kong, Hong Kong Trade Facilitation Council, no 11/90, May 1990.

36 *Idem.*, emphasis added.

> At the broader intergovernmental level a widening circle of developing countries are sending occasional or regular delegations to the UNECE Facilitation Working Party.[37] Unobtrusive, but extremely valuable, on-the-spot advice on computerision and EDI is being supplied at many points by UNCTAD, through FALPRO and the ASYCUDA (Automated System for Customs Data) programme...
>
> The need to meet and discuss technical and managerial problems has been a major spur to the formation of the numerous EDI project groups now active in Europe and the USA. These countries have good institutionai structures and high concentration of expertise - advantages lacking in most developing countries where there may be very few institutions and experts of any sort, often feeling uncomfortably isolated.
>
> Bringing interested people together to focus on the flow of useful information from other countries, to relate separate EDI developments in particular sectors to broad likely perspectives, to discuss common problems and to seek joint objectives will be an essential element in any really effective promotional and educational campaign...
>
> Finally, no-one should underestimate the importance of a purely commercial stimulus. Many of the most important EDI developments, in Europe and the USA, have come from the entrepreneurial and technological efforts of competing, value-added networks and service suppliers. Their powerful resources of innovation and experience, might well be able to move quite a few developing countries into at least the foothills of EDI applications.
>
> It may seem unrealistic to urge these and other organizations to bring the essential principles of EDI to the many developing countries which though they might need such assistance, hardly present favourable conditions for really significant applications. On the other hand key international standards are, at least available and much useful experience of EDI applications is to hand.
>
> Computerization, in what must now be seen as a wastefully outdated form, is intensifying daily in almost every developing country, and as EDI grows in the rest of the world, the trade facilitation gap, already too large, could widen alarmingly."[38]

45. Harsh words indeed, yet the ESCAP report tends to agree with this assessment. Stressing that "there is a growing need for ESCAP countries to keep pace with these developments in order to maintain a competitive position in the international trade scene."[39] It goes on to say that "it appears that EDI is fundamentally a management issue. The limited success of current EDI systems in the transport sector is related to the lack of adequate planning and proper implementation of the systems rather than for technical reasons."[40] In this connection it is, however, well to remember that an executive of a large logistics provider recently said, "the most important thing is to provide quality of service, and you don't have to be large to do that. But for a customer whose business does require larger systems capabilities or more logistics skills...it is an advantage."[41] He continued, "you have to track...products...and provide recall within 48 hours. With the sophistication of users getting better all the time, they are looking for more sophistication among the providers."[42]

46. In case someone questions whether EDI is possible in developing countries at all, readers are reminded that airlines have been using EDI throughout the world for a number of years, even from the least developed countries, without this proving too difficult. It is thus not a question of whether EDI can be utilized in developing countries, but whether developing countries can afford not to spend considerable effort and money in this field.

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37 The forty-fourth session of WP4 in September 1991 saw eight developing countries participating (Brazil, Gabon, Nigeria, Republic of Korea, Saudi Arabia, Senegal, Singapore, and South Africa.)

38 Raven, *op. cit.*, p. 11.

39 ESCAP EDI report, *op. cit.*, p. 57.

40 *Idem.*

41 T. Scanlin, Vice President, Units Companies, as quoted in "GATX & Itel to merge their 3rd party units", *American Shipper*, Jacksonville, Florida, Volume 33, No. 6, June 1991, p. 9.

42 *Idem.*

C. Legal aspects of EDI

47. One of the main problems, yet one that so far has received insufficient attention, is the legal aspects of EDI. Some work has been carried out in the development of "Interchange agreements". The most important to date are:

(a) The European *Model EDI Agreement*;
(b) The American Bar Association's *Model Electronic Data Interchange Trading Partner Agreement*; and
(c) The EDIA *Standard Interchange Agreement*.[43]

Comments have also been made by the United Nations Commission on International Trade Law (UNCITRAL) on this subject.[44] These model agreements are intended "to govern the rules of conduct and methods of operation between the parties in relation to the interchange of data by teletransmission for the purposes of or associated with the supply of goods and/or services."[45] The subject is, however, a delicate one, and the legal rapporteurs of ECE WP4 have so far not been able to come to a final position.[46]

48. Another important subject is that of "Negotiable documents". In dealing with this issue, WP4 decided that the objectives "may be to ensure a series of procedures which, by agreement (whether in the form of an interchange agreement, user manual or statute or regulation), serves to achieve the same symbolic function as that which may be achieved in a paper-based environment by the use of certain words, signatures and related actions (for example, the transfer of possession)".[47] A distinction must, however, be drawn between "those commercial arrangements between familiar parties (which is the predominant situation in which EDI applications are currently being implemented) and arrangements between strangers."[48] The legal rapporteurs to WP4 considerered that further investigation of this subject would have to be undertaken. It is possible that a solution may be proposed during the course of 1992.

D. Example of practical use of EDI

49. It may be useful here to give an example of how and where EDI may assist developing countries. One application could be, for example, to the process of receipt and delivery of containers at a port terminal. In order to speed up this process, a number of documents must first be standarized, and the data elements that are required by each party must then be identified. Once this has been done, an EDI message can be constructed. However, in view of the relatively few data elements to be transmitted, it may not be necessary to use a full EDIFACT message structure to transmit these between the terminal and the various users. What is necessary, however, is that appropriate translation software is available to receive data via third-party networks. Translation software that can convert local messages into the appropriate UNSM is also required.

50. The main reason for not simply using a UNSM is that these messages, in specific cases such as the one suggested above, may contain much unnecessary information, the electronic transmission of which will be relatively expensive. It has, for example, been reported[49] that an Australian container terminal-developed message was: "one quarter to one third the size of an EDIFACT message which means an EDIFACT message involves three or four times the cost of ours."[50]

51. Another example of EDI usage may be that of information concerning railway wagon locations

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43 EDIA stands for the Electronic Data Interchange Association of the United Kingdom.

44 UNCITRAL document "Electronic data interchange" (A/CN.9/350).

45 Standard Interchange Agreement, The EDI Association of the United Kingdom, introduction.

46 *Legal aspects of trade data interchange*, (TRADE/WP.4/R.781), p. 10.

47 "Legal aspects of trade data interchange" (TRADE/WP.4/R.781), para 12.

48 *Ibid*, p. 5.

49 John Spiers, "New truck identification system streamlines documentation for transfer of containers", *Daily Commercial News*, Sydney, 2 October 1991).

50 *Ibid*, quoting Joe Corcoran, Conaust Manager, Customer Services.

in connection with the use of ACIS. In some developing countries, the telephone network may be unreliable, and it may be simpler and safer to transmit data via an INMARSAT satellite even within one country. Connection to a satellite does not come cheap, however; consequently it has been suggested that potential users of EDI carefully scrutinize their data transmission on a "need to have" rather than a "nice to have" requirements basis[51] whether they "just" use commercial carriers for local messages, or use satellites.

E. Potential cost benefits from the use of EDI

52. At the early stages of the introduction of EDI, cost savings may not be apparent; however, in one of the most advanced application of EDI, that of the recently-introduced system for paperless terminal receival and delivery of containers in Australia, some savings were immediately identifiable. This system, which has virtually eliminated paperwork associated with the export of containerized cargoes, allows the port terminal to save a considerable amount of idle time of their employees. It has reduced or even eliminated trucking queues, and has allowed exporters to negotiate their bills of lading up to 24 hours earlier than was possible before the introduction of the system.[52] A one-day saving in the negotiation of bills of lading can translate into considerable direct benefits through earlier payment by the banks to the exporter. Elimination of truck queuing will also lead to a cost reduction, since fewer trucks will be required to carry out the same task. The elimination of paper and of re-keying of data will save clerical costs.

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51 "Standard documents and common procedures leading to the introduction of EDI for the receival and delivery of containers", n.p. (Sydney), produced by the Australian Working Group on EDI, mimeographed, September 1990, p. 14.

52 See "The paperless port - how trucks will benefit", *ATN - The Management Magazine for Transport Operators*, Sydney, September 27, 1991, pp. 37-38.